



## *Canine Osteosarcoma Fact Sheet*

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Osteosarcoma in dogs is a primary bone tumour. It usually arises in the bones of the limbs but can develop in the bones of the skull, spine or ribcage and there are rare cases of this tumour arising in non-boney tissues like mammary glands and muscle.

### **What is osteosarcoma in dogs?**

Osteosarcoma is most commonly found in large or giant breeds of dog. There are several scientific papers that correlate the development of this tumour with the weight and height of dogs and it is well known that certain dog breeds develop this tumour more often than others. In our clinic it is seen frequently in rottweilers and Irish wolfhounds in particular. Osteosarcoma of the limb bones can be extremely painful and the typical presenting complaint for these dogs is that of an intermittent lameness. The lameness may respond to standard doses of pain-killers initially but rarely for more than a week or so. At this time a swelling in the bone at the site of the tumour may be noted and this is often painful, red and hot to the touch.

### **Osteosarcoma in dogs after amputation**

Appearance of an osteosarcoma in a dog's shin bone after tumour removal (amputation)

While the most pressing concern with these patients is undoubtedly the pain associated with the primary tumour, we also need to be acutely aware of the fact that osteosarcoma in dogs spreads rapidly via the blood stream. Therefore any treatment plan needs to address the secondary spread of the cancer as well as the primary tumour itself.

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## Evaluation

The first step with a patient suspected of suffering from an osteosarcoma is to obtain x-rays of the affected site. While osteosarcoma in dogs cannot be definitively diagnosed on x-rays alone, a presumptive diagnosis can be made and in many cases biopsy is not necessary. In addition, x-rays of the lungs are obtained to rule out the presence of detectable cancers in the lungs. Any other painful bone lesions should be investigated and if there are enlarged lymph nodes in the region of the primary tumour these should be evaluated by fine needle aspirate biopsy.

## Treatment

The management of osteosarcoma in dogs focuses on both the primary and the secondary tumours.

### Treatment: Primary Tumour

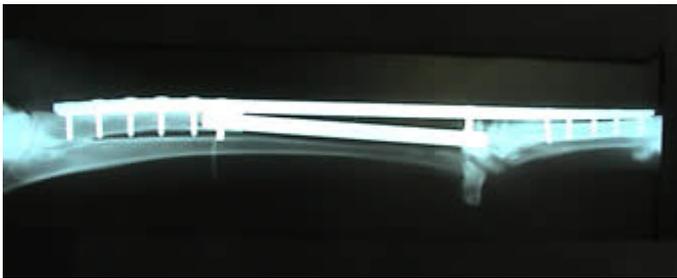
The ideal therapy would involve complete resection of the primary tumour and this most often requires amputation. Many dogs cope extraordinarily well following amputation but clearly there are some patients for whom this would be inappropriate. Concurrent neurological problems or severe arthritis constitute reasons for not considering amputation. Moderate arthritis can be managed extremely well with suitable medication and need not be a reason for not pursuing amputation; obviously this is an issue that should be evaluated on a case by case basis. Amputation invariably has a tremendous impact on the state of mind of the patient and while it is clearly a major operation, these patients seem to be so relieved to be free from the painful tumour that they recover extremely quickly.

In the event that amputation is considered inappropriate there are other options. For osteosarcomas of the distal radius (this is the lower front limb just above the wrist joint equivalent in dogs) an operation can be performed in which the tumour is removed and replaced by a custom titanium implant. The wrist joint then has to be fused so that the whole bone and metal construction can be stabilised adequately for dogs to go about their normal daily routines unaffected.

The objective of this procedure is to restore the dog to normal mobility in as short a time as possible. While this approach carries a definite appeal, it is critical to emphasise that the degree of tumour control afforded by this approach can at best be equivalent to amputation; there is also a risk of relapse of the tumour in the limb at the primary tumour site at some point in the future. More importantly, this procedure is associated with a high risk of complications, worst of which is infection associated with the metal implants.

For the patients in which amputation and the so-called limb-conserving surgery are not appropriate, palliative therapy can be administered in the form of radiotherapy and chemotherapy. The gold standard palliative therapy protocol involves the co-administration of radiation therapy on three out of four consecutive weeks with chemotherapy in conjunction with the first and final doses.

Surgical management of a bone tumour by resection of the primary tumour and replacement with titanium rod and plate implants



### **Treatment: Secondary Spread**

It is sadly the development of metastatic secondary cancer that leads to euthanasia of many patients with osteosarcoma. Optimal outcomes are achieved by treating both the primary and the secondary tumours. The best context in which to treat the secondary cancer is when there is no sign of spread on the initial diagnostic x-rays and other tests. The treatment used is chemotherapy. In our clinic this treatment is tolerated extremely well. Patients have a chemotherapy treatment that is performed by one of the oncology team, once every three weeks for a total of four doses.

Over the last few years, veterinary oncologists have tested novel combinations of chemotherapy agents for the management of secondary cancer in osteosarcoma in dogs. Despite increasing levels of side effects, there remains no good evidence of an improvement in outcome associated with these treatment protocols. With our constant emphasis on quality of life, in our clinic we choose to use chemotherapy aiming for reduced side effects

whilst maintaining the same beneficial results in terms of tumour control and overall survival. In most cases, chemotherapy treatment passes uneventfully. All owners are fully apprised of the risks of chemotherapy administration prior to embarking on a course of treatment.

Spok, 48 hours after his limb conserving surgery



## Prognosis

Following diagnosis of osteosarcoma in dogs, life expectancy can be summarised as follows:

- Without therapy average survival time is approximately two months. This is primarily determined by the discomfort associated with the primary tumour.
- If amputation is performed the average survival time is increased to six and a half months with 2% of patients alive after two years.
- Patients receiving palliative radiation and chemotherapy have an average life expectancy of six months.
- Amputation with chemotherapy makes the average survival time just a little less than one year with 20% of dogs still enjoying a good quality of life two years after surgery.
- Dogs undergoing limb-conserving surgery and chemotherapy experience the same survival time as dogs having amputation and chemotherapy.

Not all of the treatment options outlined are suitable for all patients. While it is important for owners to be aware of the options and the reasons for choosing one treatment over another, the ultimate decision about which treatment plan is most appropriate is best made in conjunction with the veterinary oncologist.

*If you are concerned about the health of your pet you should contact your veterinary surgeon.*

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